

PATENT COOPERATION TREATY

PCT

REC'D 27 JAN 2006

CORRECTED
INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

PCT

VERSION

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P.7280 WOP	FOR FURTHER ACTION		See Form PCT/IPEA/416																
International application No. PCT/GB2004/005432	International filing date (day/month/year) 20.12.2004	Priority date (day/month/year) 23.12.2003																	
International Patent Classification (IPC) or national classification and IPC B63B3/38																			
Applicant HOWES, Jonathan Sebastian et al.																			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> <i>(sent to the applicant and to the International Bureau) a total of 3 sheets, as follows:</i></p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> <i>(sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</i></p>																			
<p>4. This report contains indications relating to the following items:</p> <table> <tr> <td><input checked="" type="checkbox"/> Box No. I</td> <td>Basis of the opinion</td> </tr> <tr> <td><input type="checkbox"/> Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/> Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/> Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/> Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/> Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input checked="" type="checkbox"/> Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input checked="" type="checkbox"/> Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>				<input checked="" type="checkbox"/> Box No. I	Basis of the opinion	<input type="checkbox"/> Box No. II	Priority	<input type="checkbox"/> Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/> Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/> Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/> Box No. VI	Certain documents cited	<input checked="" type="checkbox"/> Box No. VII	Certain defects in the international application	<input checked="" type="checkbox"/> Box No. VIII	Certain observations on the international application
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Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	<p>Authorized Officer Nicol, Y Telephone No. +49 89 2399-2984</p> 																		

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/GB2004/005432

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
 - This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
 - international search (under Rules 12.3 and 23.1(b))
 - publication of the international application (under Rule 12.4)
 - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

Description, Pages

1-21 as originally filed

Claims, Numbers

1-20 filed with telefax on 11.10.2005

Drawings, Sheets

1/7-7/7 as originally filed

- a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. The amendments have resulted in the cancellation of:
 - the description, pages
 - the claims, Nos.
 - the drawings, sheets/figs
 - the sequence listing (*specify*):
 - any table(s) related to sequence listing (*specify*):
4. This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
 - the description, pages
 - the claims, Nos.
 - the drawings, sheets/figs
 - the sequence listing (*specify*):
 - any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-20
	No: Claims	
Inventive step (IS)	Yes: Claims	1-20
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-20
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

**INTERNATIONAL PRELIMINARY
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(SEPARATE SHEET)**

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Re Item V.

Document **D1 (GB 2 177 353)**, which is considered to represent the most relevant state of the art discloses a vessel according to the preamble of claim 1 and is cited in the description.

The problem to be solved by the present application is to provide a structurally non vulnerable device which generates an efficient righting moment when a significant heel angle is experienced.

The solution proposed by the application consists in providing limbs whereby each of the limbs have a zero lift surface and which is angled with respect to the longitudinal axis of the vessel so that in use it generates a component of hydrodynamic force directed away from the enclosed flow part.

The wording "with respect to the longitudinal axis of the vessel" is not present in claim 1. It seems nevertheless that this is an obvious implicit feature.

This combination of features of independent claim 1 is neither known from, nor rendered obvious by, the available prior art cited in the international search report.

Therefore the subject-matter of claim 1 is new and involve an inventive step in the meaning of Article 33(2) and (3) PCT.

Claims 2 to 20 are dependent to claim 1 and are therefore also new and inventive.

The subject-matter according to any of claims 1 to 20 is industrially applicable.

Re Item VII.

The features of the claims are not provided with **reference signs** placed in parentheses (Rule 6.2(b) PCT).

Re Item VIII.

1. In the present context and in claim 1, the mentioned "net flow of water" seems not to be a clear feature (Article 6 PCT).

**INTERNATIONAL PRELIMINARY
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2. For clarity reasons, claim 3 should not be dependent on claim 2.

CLAIMS

1. A vessel for travelling on water, comprising a hull means and a keel comprising a member depending from the hull means, the member comprising two limbs each depending from a respective lateral side of the hull means, the two limbs defining at least in part an enclosed flow path extending in a bow to stern direction, the enclosed flow path being configured to allow water incident on the vessel to flow over inner and outer surfaces of the limbs, characterised in that the limbs each have a zero-lift surface which is angled to generate in use a component of hydrodynamic force directed away from the enclosed flow path when there is a net flow of water incident in the bow to stern direction.
- 15 2. A vessel according to claim 1, wherein at least one limb comprises a portion having a symmetrical foil section.
3. A vessel according to claim 1 or claim 2, wherein at least one limb comprises an asymmetric foil section.
4. A vessel according to any of the preceding claims, wherein the angle of the zero-lift surface of at least one limb is variable.
- 20 5. A vessel according to claim 4, wherein at least one limb is of variable camber.
6. A vessel according to claim 5, wherein at least one limb comprises a moveable flap.
- 25 7. A vessel according to claim 5, wherein a portion of at least one limb is moveable.
8. A vessel according to any of the preceding claims,

wherein the two limbs each comprise a substantially straight portion.

9. A vessel according to claim 8, wherein the member comprises a pair of substantially straight limbs connected together to form a V-shape as viewed with a portion of the hull means completing the loop to form the enclosed flow path.

10. A vessel according to any of claims 1 to 7, wherein the two limbs are substantially curved.

10 11. A vessel according to any of the preceding claims, wherein the two limbs are symmetrically disposed on either side of a central, longitudinal axis of the hull means.

12. A vessel according to any of the preceding claims, wherein the two limbs are directed inwards toward the hull means where they depend from the hull means.

13. A vessel according to claim 12, wherein the two limbs are substantially perpendicular to the hull means at the point where they meet the hull means.

14. A vessel according to any of the preceding claims, 20 wherein the keel further comprises a ballast portion.

15. A vessel according to claim 14, wherein the keel comprises a ballast bulb disposed at a lowest part of the keel.

16. A vessel according to any of the preceding claims, 25 wherein at least one limb of the keel has a part having a sharp or small radius leading-edge.

17. A vessel according to any of the preceding claims, wherein at least one limb has a part having a leading edge

which is locally swept relative to a central, longitudinal axis of the hull means.

18. A vessel according to claim 17, wherein the leading edge of the part extends aftwards with increasing depth 5 from the hull means.

19. A vessel according to any of the preceding claims, wherein each limb has a lower part which is longitudinally offset relative to an upper part thereof.

20. A vessel according to claim 19, wherein the lower 10 portion of each limb is offset relative to the upper part towards a front part of the hull means.